The air was breathed over and over again by Mr. Floris, until after 10 minutes' respiration its composition had become :—

Nitrogen and argon	80·96	per cent.
Oxygen	5·40	,,
Carbon dioxide	13·64	,,
	100·00	,,

An estimation of the argon was carried out in precisely the same manner as before, on 1297·8 c.c. of breathed air, measured at 17·2° C. and 759 mm. pressure. But the air was breathed over water, the requisite change of volume on respiration having been secured by breathing into one of Dr. Marcet's counterpoised gas-holders. The argon found measured at 17·7° C. and 752·3 mm. pressure, 12·85 c.c. These numbers corrected give :—

1196 c.c. of breathed air yielded 11·72 c.c. of argon.
100 c.c. ,, ,, 0·980 c.c. of argon.

Calculating the percentage on the nitrogen, we have :—

100 c.c. of nitrogen and argon of breathed air contains 1·210 c.c.

This percentage is larger than that in normal air. One of two suppositions may be made: either the increased amount is due to the air having been confined over water during breathing, or argon is given off from blood in greater amount than it is absorbed, when the composition of the air in the lungs is so much altered; the former appears the more probable supposition. In any case the difference is not great; and it would appear that argon, like free nitrogen, plays no important part in the animal economy, save as a diluent.

III. "Examination of Gases from certain Mineral Waters." By ALEXANDER KELLAS, B.Sc., and WILLIAM RAMSAY, Ph.D., F.R.S. Received November 14, 1895.

A sample of gas of an inflammable nature, sent to Mr. Crookes by Mr. C. Lothian Bell, of Middlesbrough, from "Allhusen's Well," was sent on to us to be tested for argon. The usual constituents, nitrogen, hydrocarbons, &c., were removed by the usual absorbents, magnesium, copper oxide, &c., and finally by sparking with oxygen over caustic soda. The only noticeable feature was the great difficulty in removing the hydrocarbon, which for long resisted the action of red-hot copper oxide. The circulation had to be continued for two days before absorption was nearly complete. In one case (Kellas) 555 c.c. of gas gave 2 c.c. of residue, and in another (Ramsay)

950 c.c. gave 4·5 c.c. This corresponds to about 0·4 per cent. of indifferent gas. The first portion was unfortunately lost, but the spectrum of the second portion was carefully compared with that of argon, and the lines were all found to be coincident. No new lines appeared, nor was any helium yellow visible.

An incombustible gas from another well at the same place was also tested, and was found to contain 0·5 per cent. of argon (Kellas).

Some gas from a boiling spring near Reykjavik, Iceland, was collected last autumn (Ramsay), and, on removing the combinable constituents, 7·45 c.c. were obtained from 660 c.c. of the gas. This is a greater proportion of argon than is present in air, being 1·14 per cent. No helium could be detected in the gas, nor were there any lines which could not be recognised as belonging to argon.

It has been thought worth while to place on record these experiments, although they show nothing remarkable. We have to express our indebtedness to Mr. Noel Heaton for help kindly rendered.

IV. "Contributions to the Mathematical Theory of Evolution. III. Regression, Heredity, and Panmixia." By KARL PEARSON, University College, London. Communicated by Professor HENRICI, F.R.S. Received September 28, 1895.

(Abstract.)

THE object of this paper is to develop the methods and generalise the conclusions of Mr. Francis Galton's work on 'Natural Inheritance.' It endeavours to show the wide field which a purely statistical (as distinguished from a mechanical or physiological) theory of heredity may be made to cover. In order to do this it is needful to define certain biological terms in such a manner that they are capable of quantitative measurement, the symbols in terms of which they are expressed being the standard-deviations, correlation-coefficients, and regression-coefficients already well known from the labours of Mr. Galton. The fundamental assumption made is that the distribution of variation in any organ or characteristic follows the normal law. It is pointed out that this distribution, although very general, is not absolute, and that, especially in cases of disease and heredity, we require the consideration of skew-variation and skew-correlation.

The quantities mathematically defined are variation, correlation, natural, sexual and reproductive selection, heredity, regression, and panmixia. The definitions given agree in part with those already adopted by Mr. Galton or Professor Weldon. At some points they extend or develop the ideas of those naturalists. In particular the author finds it necessary to emphasise the distinction between two